DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **Equilon Enterprises LLC – Puget Sound Refining Company**
Facility Address: **P.O. Box 622, 8505 S. Texas Road, Anacortes, WA 98221**
Facility EPA ID #: **WAD009276197**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   __X__ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Current Human Exposures Under Control
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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"** [1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	_X_	___	___	**SWMUs 1, 11, and LTF; MTCA 10 Hydrotreater #2, Blending Plant**
Air (indoors) [2]	___	_X_	___	
Surface Soil (e.g., <2 ft)	___	_X__	___	
Surface Water	___	_X_	___	
Sediment	___	_X_	___	
Subsurf. Soil (e.g., >2 ft)	_X_	___	___	**SWMUs 1, 11, and LTF; MTCA 10; Hydrotreater #2, Blending Plant**
Air (outdoors)	___	_X_	___	

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__**X**__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Groundwater

Location	Constituent	Appropriate Protective Level (ug/l) (MTCA)
SWMU 1	Benzene	5
SWMU 11	Benzene	5
	Ethylbenzene	30
	Xylene	20
	1,2-Dichloroethane	5
Land Treatment Farm (LTF)	Benzene	5
MTCA 10	TPH	1000
Hydrotreater #2	Benzene	5
	Toluene	40
	Ethylbenzene	30
	Xylene	20
Blending Plant	Benzene	5
	Toluene	40
	Ethylbenzene	30
	Xylene	20
	TPH	1000

Air (Indoors)
Buildings are not located in contact with any of the indicated locations.

Surface Soil (e.g., <2 ft)
Impacted soils are at depths greater than 2 feet with the exception of the Blending Plant. Texaco remediated the Blending Plant by installing an impermeable liner, capping the site and mitigating worker exposure. The cap also acts to limit migration of residual groundwater by eliminating water infiltration from immediately above the site.

Surface Water
There are no constituents of concern released to surface waters about the appropriately protective risk-based levels. Process water and contaminated stormwater runoff are directed to the wastewater treatment plant.

Sediment
There are no constituents of concern above the appropriately protective risk-based levels in sediments.

Subsurface Soil (e.g., >2 ft)

Location	Constituent	Appropriate Protective Level (ug/l) (MTCA)
SWMU 1	Benzene	5
SWMU 11	Benzene	5
	Ethylbenzene	30
	Xylene	20
	1,2-Dichloroethane	5
Land Treatment Farm (LTF)	Benzene	5
MTCA 10	TPH	1000
Hydrotreater #2	Benzene	5
	Toluene	40
	Ethylbenzene	30
	Xylene	20
Blending Plant	Benzene	5
	Toluene	40
	Ethylbenzene	30
	Xylene	20
	TPH	1000

Air (outdoors)
There are no constituents of concern above the appropriately protective risk-based levels in air (outdoors) from the indicated locations.

References

- Workplan for the RCRA Facility Investigation of Solid Waste Management Units at the Texaco Puget Sound Plant, Prepared by K.W. Brown & Associates, Inc., November 1990

References for SWMU 1

- Phase I Investigation of Oily Water Sewer (SWMU 1) Release at Manhole #6-E, K.W. Brown Environmental Services, August 1991
- SWMU 1 RFI Workplan Amendment, K.W. Brown Environmental Services, August 1991
- RFI Report for SWMU 1—Oily Water Sewer, K.W. Brown Environmental Services, January 1992
- Workplan for the Phase II RCRA Facility Investigation of SWMU 1—Oily Water Sewer, K.W. Brown Environmental Services, July 1992
- Letter from Texaco requesting use of camera survey in lieu of Phase II workplan, September 1994

References for MTCA 10

- Reconnaissance Sampling at the East and West Impounding Basins (SWMUs 10 and 11), K.W. Brown & Associates, Inc., December 1990
- RFI Report for SWMUs 10 and 11, K.W. Brown & Associates, Inc., April 1991
- Hydrocarbon Source Delineation in the Vicinity of RCRA SWMU 10, K.W. Brown & Associates, Inc., September 1992
- Summary of SWMU 10 Investigations—Texaco Puget Sound Plant, Remediation Technologies, Inc., June 1995
- Status Report on the Independent Cleanup of Hydrocarbons in the Vicinity of the Intermediate Impounding Basin (MTCA 10), submitted to Ecology semiannually, September 1993 to present

References for SWMU 11

- Reconnaissance Sampling at the East and West Impounding Basins (SWMUs 10 and 11), K.W. Brown & Associates, Inc., December 1990
- Sludge/Sediment Removal and Soil Sampling at the East and West Impounding Basins (SWMUs 10 and 11), K.W. Brown & Associates, Inc., December 1990
- RFI Report for SWMUs 10 and 11, K.W. Brown & Associates, Inc., April 1991
- RFI Workplan Amendment and Project Update—SWMU 11, K.W. Brown & Associates, Inc., June 1991
- SWMU 11 Pump Test, K.W. Brown & Associates, Inc., October 1991
- Workplan for Conducting SWMU 11 Phase II RFI Activities, Texaco Puget Sound Plant, Anacortes, Washington, K.W. Brown & Associates, Inc., April 1992
- Interim Groundwater Monitoring and Sampling Report—SWMU 11, submitted to Ecology semiannually, July 1992 to present

Land Treatment Farms

- Final Class 3 Permit Modification Request, ThermoRetec Consulting Corporation, May 2000
- Part B Permit Renewal, ThermoRetec Consulting Corporation, May 1999

References for Hydrotreater #2

- Groundwater Assessment Report for the Hydrotreating Unit No. 2, Texaco Refining and Marketing Inc., April 1994

References for Blending Plant

- Surface Soil Assessment in the Vicinity of the Blending Plant, Texaco Refining and Marketing Inc., May 1993

References for Areas of No Further Action

- Workplan for the RCRA Facility Investigation of Solid Waste Management Units at the Texaco Puget Sound Plant, Attachment 1 Environmental Assessment—Alkylation Units 1 and 2, Prepared by K.W. Brown & Associates, Inc., November 1990
- RFI Report for SWMU 31, March 1991
- Letter from EPA confirming that no further investigative or remedial activities need to be undertaken for SWMU 31, June 25, 1991
- RFI Report for SWMU 30, July 1991
- RFI Report for SWMUs 40 and 46, K.W. Brown & Associates, Inc., July 1991
- Closure Plan for Interim Status Surface Impoundments at the Texaco Puget Sound Plant, Effluent Treatment Plant, K.W. Brown & Associates, Inc., December 1992
- Consent Decree for Flare Landfarm, August 1993
- Final Closure Report for the South Overflow Basin, Remediation Technologies, Inc., April 1994
- Final Closure Report for the North Overflow Basin, Remediation Technologies, Inc., November 1994

- Final Closure Report for the Equalization Basin, Remediation Technologies, Inc., December 1994
- Final Closure Report for the Surge Basin, Remediation Technologies, Inc., December 1994
- EPA letter dated April 7, 1997 stating that no further action is required for SWMUs 8, 9, 10, 30 and 31.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)						
"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	Yes	No	Yes	No	No	No
~~Air indoors)~~							
~~Soil (surface, e.g., <2 ft)~~	No	No	No	No	No	No	No
~~Surface Water~~							
~~Sediment~~							
Soil (subsurface e.g., >2 ft)	No	Yes	No	Yes	No	No	No
~~Air (outdoors)~~							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__**X**__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

Potential worker and construction worker exposure to sub-surface soils and groundwater that contain TPH and TPH constituents may exist. The most likely scenario would involve excavation activities during construction in areas that could potentially contain affected sub-surface soils and groundwater. The locations where there may be constituents of concern above the appropriately protective risk-based levels are identified in Section 2.

PSRC has programs in place to manage potential exposure during construction work. The facility maintains programs in compliance with OSHA and WISHA for safety/hotwork/enty permitting, personal protective equipment, respiratory protection, and other aspects of worker safety specifically designed to avoid the exposure of any individual, worker or contractor, above the permissible exposure level (PEL). Employees and contractors are trained on the requirements of these programs annually, and the requirements of these programs are rigorously enforced.

Footnotes:

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

__X__ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

PSRC has programs in place to manage potential exposure during routine work and construction work. The facility maintains programs in compliance with OSHA and WISHA for safety/hotwork/enty permitting, personal protective equipment, respiratory protection, and other aspects of worker safety specifically designed to avoid the exposure of any individual, worker or contractor, above the permissible exposure level (PEL).

- Employees and contractors are trained on the requirements of these programs annually, and the requirements of these programs are rigorously enforced.
- The facility is fenced, and security forces limit access to authorized individuals. Therefore, exposures to trespassers are highly unlikely.

Footnotes:

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable") - continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):_____

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__**X**__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Equilon Enterprises LLC— Puget Sound Refining Company** facility, EPA ID # **WAD009276197,** located in **Anacortes, WA** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature) _____ Date 4/17/01
(print) Nancy Kmet
(title) Acting Petroleum Refinery Specialist

Supervisor (signature) _____ Date 4/18/01
(print) Carol Kraege
(title) Industrial Section Manager

Locations where References may be found:

Washington State Department of Ecology, Industrial Section
(360) 407 – 6916
300 Desmond Drive
Lacey, Washington 98503

Contact-telephone and e-mail numbers

(name) Nancy Kmet

(phone # **(360) 407-6941**

(e-mail) **nkme461@ecy.wa.gov**

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.